platyceps. Portions of a cranium and mandible are referred to a *Meiolania minor*. Both species, as in *Megalania*, are edentulous with modifications of the mouth indicative of a horny beak, as in the Chelonian order. The cranial and vertebral characters are, however, sauroid. Horn-cores in three pairs are present but shorter relatively, especially the first and third pairs, than in *Megalania prisca*. The indication of a seventh more advanced and medial horn is feeble, and the author remarks that in the small existing lizard (*Moloch*) this horn has not an osseous support. The tail of *Meiolania* is long and stiff; the vertebræ being encased by an osseous sheath, developing, as in *Megalania*, tuberous processes in two pairs, corresponding with the vertebræ within: such defensive parts are less developed, relatively, than in *Megalania prisca*.

The locality of these singular remains is an insular tract not exceeding 6 miles by 1 mile in extent; situated mid-way between Sydney and Norfolk Island, in lat. 31° 31′ S., long. 159° 9′ E. The island is formed of three raised basaltic masses connected by low-lying grounds of blown coral-sand formation, consisting of rounded grains and fragments of corals and shells. In the parts of this formation converted into rock were found the petrified remains which are the subject of the present paper. It is accompanied by drawings of the most instructive fossils: these form the subjects of five plates illustrative of the text.

III. "On the Luni-Solar Variations of Magnetic Declination and Horizontal Force at Bombay, and of Declination at Trevandrum." By CHARLES CHAMBERS, F.R.S., Superintendent of the Colaba Observatory, Bombay. Received March 24, 1886.

(Abstract.)

The materials described in this paper are twenty-five years of declination observations, and twenty-six and a half years of horizontal force observations, taken at the Colaba Observatory, Bombay, and some results of ten years declination observations taken at the Trevandrum Observatory. A consideration of the lunar diurnal variations derived from these observations for different seasons and phases of the moon, leads the author to form the hypothesis that these variations are, properly speaking, combinations of solar diurnal variations that run through a cycle of change in a lunation. The characteristics of the variations that give rise to the hypothesis are (1) that generally the great movements occur in them, as in the mean solar diurnal variations for full lunations, in the solar *day hours*, whilst the night hours are relatively quiescent; and (2) that they

have generally the same character and range at intervals of half a lunation, and opposite characters at intervals of a quarter of a lunation. An expression for the variation at any age of the moon that would satisfy these characteristics would take the form

$$f_{c\cdot 2}(h)\cos 2\left(\frac{2\pi}{\mathrm{P}}t\right)+f_{s\cdot 2}(h)\sin 2\left(\frac{2\pi}{\mathrm{P}}t\right),$$

where h is the hour of the solar day, P the mean period of a lunation, and t the age of the moon, and $f_{c\cdot 2}(h)$, $f_{s\cdot 2}(h)$ are solar diurnal variations that are constant for the same season of the year. It was found that although such a formula embraced the bulk of the phenomena, there remained minor characteristics of a systematic kind that found expression only in the extra terms of the formula when extended as follows:—

$$f_{c\cdot 1}(h)\cos\left(\frac{2\pi}{\mathrm{P}}t\right)+f_{s\cdot 1}(h)\sin\left(\frac{2\pi}{\mathrm{P}}t\right)+f_{c\cdot 2}(h)\cos 2\left(\frac{2\pi}{\mathrm{P}}t\right)+f_{s\cdot 2}(h)\sin 2\left(\frac{2\pi}{\mathrm{P}}t\right)$$

Not only does the hypothesis hold good in the different seasons of the year and with respect both to the declination and horizontal force at Bombay, but the variations of the two elements are related to each other in a definite manner; in the winter season the variations of declination at one age of the moon are similar to those of the horizontal force at an age of the moon one-eighth of a lunation greater; and conversely, in the summer and autumn the variations of horizontal force take precedence of those of the declination by one-eighth of a lunation. So far as the means of testing it are available, the hypothesis holds also in respect of magnetic variations at Trevandrum. Each term of the formula is symbolical of a definite physical conception, viz., that an otherwise constant variation swells and contracts with a wave-like motion, as the age of the moon increases, between the limits $-f(h)$ and $+f(h)$. The existence of luni-solar variations of the kind described is, so far as the author is aware, brought to light for the first time, by the long series of observations taken at Bombay, and their capability of expression in a compact form which has a definite physical significance cannot, the author thinks, fail to be helpful towards the discovery of the physical conditions that lie behind them.

IV. "On a New Form of Stereoscope." By A. Stroh. Communicated by Lord Rayleigh, D.C.L., Sec. R.S. Received March 22, 1886.

Although the late Sir Charles Wheatstone's beautiful invention, the stereoscope, gives the appearance of full relief or perfect solidity to photographs of objects seen by its aid, the photographs for the